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THE HAMPDEN HIPPOCRAT

MARCH-APRIL 1991
VOLUME XXXXVI NO. 1

IN THIS ISSUE

From The MMS Regional Office	5
HDMS President's Message	6
Pathology Practice—State-Of-The-Art And Expectations For The Future	8
Notes From The Underground	11
Flow Cytometric Analysis Basic Information	13
"Crisis In Practice Of Forensic Pathology In Massachusetts"	15
Molecular Genetics And Clinical Laboratory Medicine Today	16
Preserving Professionalism	18
P.C.I.S. Is Here!	20
Bridges For Peace	22
Welcome New Members	23
The Last Word	24
John J. Ring, M.D.	25
In Memoriam	25
The "Doctor's Letter"—What Is Our Obligation?	26

The official bulletin for The Hampden District of the Massachusetts Medical Society. Founded in 1942 by Edward P. Bagg, Jr., M.D. and William A. R. Chapin, M.D.

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HAMPDEN DISTRICT MEDICAL SOCIETY 1991-1992 SEASON

ANNUAL MEETING

PLACE:	**CARRIAGE HOUSE** Old Storrowton Tavern West Springfield, MA
DATE:	Tuesday, April 23, 1991
BUSINESS MEETING:	6:00 p.m.
SOCIAL HOUR:	7:00 p.m.
DINNER:	7:30 p.m., Spouses are welcome!
SPEAKERS:	RICHARD C. GARVEY, Associate Publisher Union News/Sunday Republican

NOTE: If you must cancel your dinner reservation, please call the office before noon on April 23rd. If the cancellation is not made, you will be BILLED for your dinner.

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From The MMS Regional Office

The "Doctor for a Day" Program

On January 25, sixteen members of the Hampden District Medical Society and eight community leaders gathered to partake in the district's second "Doctor for a Day" Mini-Intern Program.

The "Doctor for a Day" program, launched in April 1991, was designed to foster working relationships among physicians and community leaders who influence health care policy. The internship provides participants with a firsthand view of the practice of medicine and ongoing efforts to contain health care costs without sacrificing quality of care. The program also strives to illustrate how decisions made by our community leaders impact the care provided the patients.

Where last year's program was limited to state legislators, this year's interns were selected from a wide variety of backgrounds to include local political figures, insurance executives, hospital trustees, business leaders and media representatives. Physician participants, all volunteers, were drawn from an assortment of specialties including internal medicine, obstetrics and gynecology, emergency medicine, surgery, ophthalmology, pediatrics, family practice, gastroenterology and dermatology.

Each intern had the opportunity to spend the day with two physicians, allowing for a half day at each doctor's side observing daily rounds, committee meetings, office visits, surgery and emergency care. It should be noted that all of the district's medical facilities participated in the program, and that without their full support and cooperation the tremendous success of this year's "Doctor for a Day" program would never have been realized.

The most interesting part of the day, from the program planners point of view, is during the debriefing reception held at the close of the day. During this session, attended by all participants, both interns and physicians, there is a candid discussion of the program, how individuals responded to different situations, what their reactions were to the current medical environment, and how their original perception of medicine might have been different from what they experienced.

Interns discussed a variety of experiences at the debriefing reception. Most agreed that they could not have done more in one day. They found themselves exhausted both physically and mentally. One intern was amazed by the range of patient problems that present themselves to physicians each day, from the serious to the ridiculous. Another intern claimed that physicians were much more human to him now, that the day satisfied his curiosity and that he came away with a real understanding and appreciation for what a physician does each day, and respect for the skill physicians in Hampden County bring to the community. "These physicians," it was stated, "need not take a back seat to anyone, anywhere."

One intern, who had been a medic during World War II, was amazed by the current level of technology in the hospital. This brought about a discussion of how technology has necessitated the making of a very difficult ethical decisions and a review of the new Health Care Proxy Law. One intern was amazed by how challenging it must be for physicians to stay emotionally neutral with their patients. "Even after only one day," an intern claimed, "I felt attached to those patients." "I could not do that day after day."

Physician participants had much to gain as well. There was unanimous agreement that having a lay person with them for a day allowed them to look at their profession differently, and that seeing it all through the eyes of an outsider was very interesting.

For more information about the "Doctor for a Day" Mini-Intern Program, please contact the Massachusetts Medical Society, West Central Regional Office at 1-800-522-3112. ■

Kerin L. Milesky
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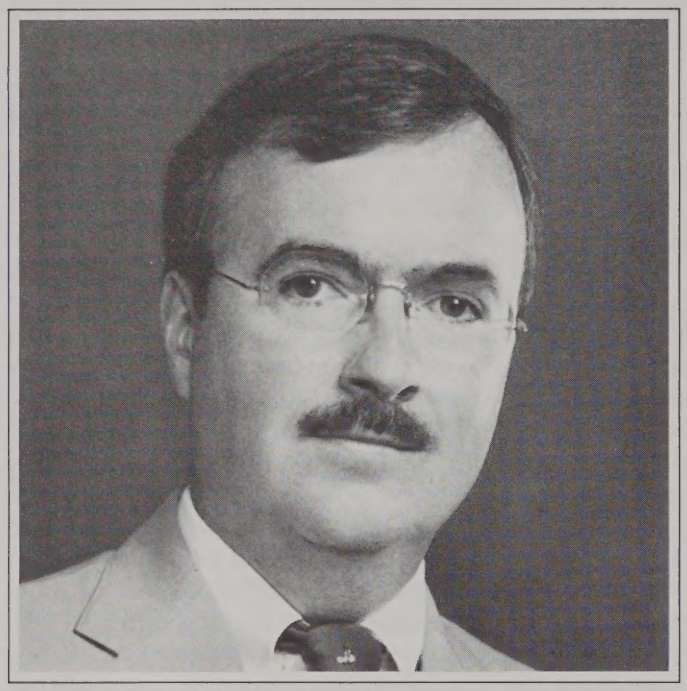
HDMS President's Message



Joseph P. Keenan, M.D., President

Persian Gulf War

The effect of the Persian Gulf War has struck deeply into the fabric of our medical community here in Western Massachusetts. We can be very proud of the noble and self-sacrificing role that our colleagues are playing in the unfolding drama in the Middle East.

While the majority of us are safe here at home, a small number of our members are contributing to the war effort having been activated to duty from the reserves. We should show our support for our colleagues who have been called up in any way that is fitting.

We must not forget the family members who have been left behind, and should make every effort to demonstrate to them our appreciation for the sacrifice that their family members are making for the good of us all. While we cannot fully know their anxiety and pain, we can offer our heartfelt prayers for the safe return of their loved ones, and a speedy just conclusion to this terrible conflict.

January District Meeting

A very enjoyable evening was had by all who attended the January District meeting. We were honored by the presence of the President-Elect of the American Medical Association, Dr. Ring. He gave a brief talk on "Professionalism in the Practice of Medicine" and responded to questions from the members of the Hampden District Medical Society. It should be noted that he was very well received by members of the local print and news media and had approximately fourteen interviews during his brief stay here in Western Massachusetts.

We also had the honor to play "host" for members of the Massachusetts delegation to the American Medical Association. They specifically made the drive to attend the Hampden District meeting for the opportunity to hear Dr. Rings's speech and to speak with him personally prior to his talk.

Oftentimes, we take our good fortune for granted, but it should be pointed out that the Hampden Medical Society is truly privileged to have the President-Elect of the American Medical Association personally visit our district and to be the principal speaker at our District Meeting in January each year. It is a long standing tradition and one that our members should take advantage of! How can a national organization be more responsive to its members needs when its national President-Elect personally visits our district each year?

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Health Care for the Homeless

Everyone should have received the letter from me regarding the Health Care for the Homeless program. Your participation in this program, at whatever activity level you desire would be warmly encouraged. As you know, there are many people who have "fallen through the cracks" in the health care floor. These are the people who, for whatever reason, are lacking any sort of medical insurance, be it private, Medicare or Medicaid. These are the people who don't see physicians in *any* setting for *any* reason until a major crisis develops!

Some of these patients are being recognized by the nurses who work in the Health Care for the Homeless Department of the Sisters of Providence. I have been told that the needs identified by these nurses would be met if each physician would see just one patient a month on referral from their organization.

As a result of conversations with them, this survey is being done to solicit support for this worthwhile program from our membership. One patient a month is very little to ask; they have nowhere else to turn. It would be wonderful if a majority of our members responded affirmatively.

AMA / ABA Drug Program

The initial training session for the Drug/Alcohol Abuse Program was recently carried out at the offices of the President of the Hampden County Bar Association, Attorney William Fitzgerald. He graciously allowed the use of his offices for this training session, and it was appreciated. As you know, there are problems associated with the illicit use of drugs. Physician/Lawyer teams have been educated as to content and style of presentation to effectively communicate with middle school aged children. They will meet in small discussion groups. Hopefully, the factual information combined with positive role models will motivate students to abstain from the use of drugs. Our culture constantly bombards us with the message that drug use (including alcohol) is glamorous and exciting. We will attempt to present the whole story, by presenting factual information to these students.

"Doc for a Day"

"The Doctor for a Day Program" under the direction of Chair Person Dr. Nancy Weiss was an outstanding success and hopefully will become a permanent fixture of the Hampden District Medical Society. We get consistent "rave reviews" from the participants in this program. It allows politicians and other major players in the health care establishment to understand some of the complexity in the day to day affairs of running a medical practice.

The practice of medicine is not as simple as many would lead the public and politicians to believe—and it is truly an enlightening experience for the participants to spend a day as "Docs" in the world of medicine.

Any deepening of the understanding that the participants gain from their participation in this program will benefit physicians and patients alike. We all become winners when the climate for the delivery of health care in the commonwealth is improved. We wish to thank the physicians involved for taking time from their busy schedules to be part of this very important program. We hope next year that many of these same physicians will also agree to contribute their time and expertise to this program and hope many more of our colleagues also decide to participate.

This has been a busy season for the Hampden District Medical Society and as always your participation and active involvement in the running of the organization is encouraged. Hampden District can only be as good as its member's involvement. ■

EDITOR'S NOTE: *Physicians interested in helping with the Program for the Homeless should contact the District Office 736-0661, or return the questionnaire sent out by Dr. Keenan's office.*

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Pathology Practice—State-Of-The-Art And Expectations For The Future

Jerald M. Rosenbaum, M.D. is a Pathologist at Baystate Medical Center and president of the Massachusetts Society of Pathologists and is guest editor for this issue.

Pathologists are physicians specializing in laboratory sciences to diagnose disease. Our work involves varying degrees of practice, teaching and research, and, yes, includes doing autopsies. The specialty began shortly after the turn of this century. Prior to that time, physicians conducted and analyzed their own laboratory tests, and even performed autopsies. As scientific knowledge, technology and specialization in medicine rapidly grew, it became increasingly difficult for clinicians to divide their time between the examining room and the laboratory, and the clinician-pathologist became a thing of the past.

Physicians began specializing in pathology to provide other doctors with laboratory analyses necessary for modern medicine care. Because of the pathologist's role to assist other physicians, we are sometimes referred to as the "doctor's doctor". As pathology practice evolved, it became divided into two major areas, anatomic pathology and clinical pathology. Both areas have experienced major technologic and regulatory changes in the past decade, which are revolutionizing how we practice now, and what our practice will be like in the 21st century.

Anatomic Pathology (AP): AP involves major professional efforts personally provided by the pathologist to patients and their attending physician. There are three major areas within AP: the diagnostic areas of surgical pathology, including morphologic hematology; cytology and fine needle aspiration cytology (FNA); and autopsy pathology.

Most pathologists spend a major portion of their time in surgical pathology, where they provide diagnostic, prognostic, and management information by morphologic examination of tissues removed at surgery. Similarly, the cytopathologist is a consultant to the clinician in terms of providing cytology diagnoses on PAP smears and, more recently, diagnoses from FNA.

Though PAP smears have been available for more than 50 years and have been credited with a marked reduction in mortality from cancer of the uterine cervix, the quality of this test came under attack in the mid 1980's, most importantly from articles in the popular press, such as the *Wall Street Journal* and the *New York Times*. These articles exposed "PAP mills", laboratories that examined large numbers of PAP smears at very low prices, sacrificing quality at times, leading to failure of timely diagnosis of some cases of cervical cancer, and resulting in deaths from cervical cancer, some of which were considered, in retrospect, preventable. These articles sparked congressional hearings on PAP smear quality and, subsequently, clinical laboratory test quality, which eventually resulted in the passage of the landmark bill, the Clinical Laboratory Improvement Act of 1988 (CLIA '88), by the U.S. Congress. Whereas previously, only large laboratories, perhaps 12,000 at most, all dealing in interstate commerce, were regulated by the federal government, CLIA '88 extended federal government regulation to include not only all hospital laboratories in the country, but also many laboratories in the offices of practicing clinicians. Regulations by the federal government to implement CLIA '88 were proposed in 1989 and 1990, and have aroused great concern by pathologists about the expense of compliance, as well as many specific compliance issues within the regulations, many of which are related to regulation of cytology laboratories.

In particular, it is feared that many smaller cytology laboratories, rather than abide by CLIA '88 cytology regulations, will go out of business. Indeed, a recent review of the new regulations by the General Accounting Office of the U.S. Government concludes that the regulations, as presently drafted, will result in decreased access and higher charges for PAP smears. This is most unfortunate, as the PAP smear is greatly underutilized in this country. To quote Blaustein's Third Edition, "Only half of United States women age 20 or over have ever received a PAP test."

The emergence of FNA as an important diagnostic tool in the 1980's has had an increasingly major impact on clinical practice. This technology, which uses needles to aspirate tissue fragments, has been used to sample the cells of clinically and radiographically identified masses, not only from superficial sites, such as breast, but also from the deepest recesses of the body, including the retroperitoneum and the central nervous system. This technology often provides definitive diagnosis of tumor masses, thereby precluding the need for invasive surgical biopsy, with its attendant morbidity and mortality. The safety of FNA has been proven in the last decade, as complications from the procedure are very few, and usually of minor importance.

All areas of diagnostic pathology are rapidly being changed by new molecular biology related technology. Immunohistochemistry allows, for example, more percise differential diagnosis of histologically undifferentiated tumors, as well as more specific diagnosis of infectious processes, such as hepatitis, herpes and CMV infections.

Furthermore, various forms of DNA-related technology,

such as molecular gene rearrangement tests, in situ hybridization techniques, and polymerase chain reaction technology are just now moving from research labs to larger clinical labs and reference labs. Immunohistochemistry technology, on the other hand, is now widely available as commercial test kits, even for use in smaller labs, or from commercial reference labs. Larger labs, such as Baystate Medical Center (BMC), have developed extensive capabilities in this area; BMC presently has a library of approximately 75 immunocytochemical antibodies.

Wither the Autopsy?—Today, autopsies are a relatively minor aspect of pathology practice. Autopsy rates in hospitals have declined from approximately 40-50% twenty years ago, to as low as 5-15%, with the larger number of autopsies being done generally in teaching hospitals. This decline is a result of several factors. The elimination of a 20% minimum autopsy rate for hospital accreditation by the Joint Commission for Accreditation of Hospitals and Other Health Care Organizations (JCAHO) is a major factor. This policy is presently under re-examination by JCAHO. Other reasons given for decline of the autopsy include: availability of improved diagnostic tools, such as CT Scan, said to obviate the need for autopsy; fear of malpractice suits, where some physicians fear that an autopsy may reveal a mistake, or perhaps an undetected condition; and financial disincentives to pathologists and hospitals. Virtually no third party payors reimburse for autopsies, and pathologists usually are not paid directly for the autopsy, with the costs, $1,000-$2,000 per case, being absorbed by the hospital.

Finally, the manpower issue is very important. An autopsy rate similar to that seen 15 years ago would make it virtually impossible for many pathology groups to read their current volume of surgical pathology and cytopathology material and to oversee laboratory operations.

At this time, some authorities predict virtual extinction of the autopsy while other insist that its value as an educational and quality assurance tool are essential to modern medical practice. To survive into the next century, the autopsy protocol will likely be altered. Mandated minimum rates are not the answer. Cases for autopsy in the hospital should be carefully selected and clinically directed, that is, specific clinical questions should be asked prior to the autopsy, defining its extent, with autopsy findings not only well communicated to the requesting medical authority, but also to the family. No discussion of the autopsy is complete without mentioning the medico-legal autopsy. Presently, as a result of the Massachusetts' fiscal crunch, the medico-legal system is in real danger of collapse (see accompanying article).

Clinical Pathology (CP): CP is the specialty of laboratory medicine. This aspect of the pathologist's practice is basically an inquiry system; it exists to answer questions. Physicians ask these questions in the form of test requests, and the laboratory transforms specimens obtained in response to those requests into useful clinical laboratory reports, i.e., clinical information. Clinicians sometimes take for granted the quality of laboratory measurements. After all, the modern "black box" measuring devices, often computer controlled, seem infallible.

While they, indeed, have promoted improved reliability, wider test availability to the smallest lab operation, and more rapid turnaround time, they must be properly managed for optimum performance.

The clinical pathologist provides the professional interface to the laboratory for clinicians in terms of clinical interpretation of tests, clinical consults, recommendations to add/delete tests from the test list, education and research activities. He also manages the various laboratories in hospitals or free-standing clinics. While pathologists in smaller institutions or free-standing clinics are usually generalists concerned with all facets of anatomic and clinical pathology, the pathologist in larger institutions, such as Baystate Medical Center, usually specializes within the various disciplines of anatomic and/or clinical pathology, to varying and increasing degrees.

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Pathology Practice
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Cost Containment and Cost Effectiveness Issues—Pressure to control and ratchet down costs has increased markedly in the seven years since prospective payments for hospitals were introduced by the federal government. We note an accelerating pace of introduction of new technology into the lab in the past five years and this promises to accelerate in the next 10 years. Some technologies will help to contain costs, i.e. the computer chip in chemistry analyzers and lab computers, and the emergence of biosensors to provide economic testing at the bedside, while others, including new applications derived from major advances in molecular biology, i.e. various DNA probes to diagnose prenatal disease, to diagnose various microbes such as virus particles and to improve our diagnostic, prognostic and management functions in oncology, will add costs.

It will be our challenge, along with interested clinicians, to establish these new technologies as not only medically useful, but also cost effective. New technologies and their implications will be further discussed in this issue in accompanying articles by Drs. Pflueger and Otto. As we approach a new century, pathologists will be challenged to become proactive and move away from a static morphologic structure-based practice, and begin to apply these newly developed molecular biology tools in their daily practice.

Manpower Issues—For many years, the number of physicians training to be pathologists ranged from approximately 5% to 7% of all resident physicians in the U.S.A. In the last ten years, however, this number has steadily fallen, so that at the present time, pathology trainees now constitute only 2.7% of all residents. Since the beginning of pathology residency programs in 1927, this percentage has never been so small. The reasons for this include the Tefra Federal Budget Law of 1982, which severely restricted reimbursement of clinical pathology practice, essentially making it a "Part A" service, and increased governmental regulation of the rest of pathology practice. Pathologists feel squeezed by administrators feverishly trying to contain exploding hospital and outpatient lab costs, while being asked, as lab directors, to provide not only more sophisticated and expensive laboratory services, but more frequent and timely testing schedules. As a result of these pressures, increased numbers of pathologists have opted for early retirement in the past ten years. Specifically, I am aware that three of the approximately 20 pathologists in the Connecticut Valley, under the age of 65 years, have retired in the last year, or will retire in the next few months.

Nationally, the most recently published manpower data show that about 600 pathologists per year are needed to fill community hospital and private laboratory pathology slots in the five years beginning in 1988[1]. Based on present output of pathology training programs, only about 40-45% of the community hospital/private lab pathologists needed to fill practice vacancies will be produced in the next five years. Thus, it would appear that a severe community hospital/private lab pathologist shortage is inevitable.

What Will the Future Hold for Pathology?—Emphasis by payors and administrators on containing costs and regulating our patterns of practice will increasingly impact the practicing pathologist, who will have to work harder, not only to maintain his income, but also to satisfy an ever-increasing body of practice regulations. He will find it increasingly difficult to balance conflicting demands of patients and their clinicians for access to the newest technologies, while payors of care try to rein in costs. The challenge to the modern pathologist will be not only to become acquainted and facile with new technologies by integrating them with his traditional skills, but also to work with clinicians to learn to appropriately use this new technology in a cost effective manner. ■

References

1. Benson, E.S. et al. National Pathology Manpower Survey of 1988. *Archives of Pathology and Laboratory Medicine,* 1990; 114:566-569.

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Notes From The Underground
Diary of a Clinical Pathologist

Lewis Lefer is Chief of Pathology at Mercy Hospital and past president of the Massachusetts Society of Pathologists.

7:21 a.m. I arrive at the laboratory and pass through the reception area. No patients have come yet; the magazines are neatly stacked. Several of the phlebotomists are still out on the floors drawing blood. It is like the calm before the storm. Before the day is over, 70 or 80 patients, young and old, will have passed through the waiting area, and almost 1,500 tests, including chemistry, microbiology, blood bank, hematology, radioimmunoassay, and anatomic and clinical pathology, will be performed. A few children will scream loudly at the sight of a white coat and a needle.

7:28 a.m. I am called to the operating room for a frozen section examination. Dr. R. Putnam is operating on a forty-two year old woman who has had calcifications detected on her annual screening mammogram. No mass was palpable by the referring general practitioner or by the surgeon himself. A sample has been removed and given to me. I observe a 5 X 2.5 X 2cm. piece of fatty tissue and apply India ink to all of the margins. I serially section the specimen and detect an ill-defined gray area 7mm. in greatest dimension. One half is saved for hormone receptor analysis. The other half is quickly frozen in a cryostat at minus twenty degrees centigrade. The frozen sample is then sectioned while still in the freezer at six microns (six ten thousands of a centimeter) and the section is applied to a glass slide. A succession of stains renders the nuclei blue and the cytoplasm pink. I diagnose infiltrating ductal carcinoma. Thus far, the entire process has taken nine minutes. I call Dr. Putnam, give him the diagnosis, and tell him that the margins are free of tumor. Based upon that information, he performs an axillary dissection.

Examination of breast tissue has become one of our most common procedures and, fortunately, the cancers are being detected while they are small and presumably more treatable. The third edition (1988) of the American Joint Committee on Cancer has taken this into account in redefining T stages. Because this lesion is between 0.5 and 1cm. in greatest dimension, it is staged as T1b. If it had been between 1 and 2cm., it would be T1c, and if it had been 0.5cm or less, it would be T1a. Later on I will examine the lymph nodes from this patient in order to detect the nodal status, and assess it pN0 if all nodes are negative, pN1a if a micrometastasis is present, or pn1b if a metastasis occurs larger than a micrometastasis. These data will be used to determine the most effective treatment.

7:52 a.m. Alan Boulton, an Emergency Department physician, calls me to request a stat CKMB. He has a fifty-one year old man with atypical chest pain, and nonspecific ST and T wave changes in the electrocardiogram. Although he suspects that the patient has esophagitis, he cannot clinically exclude a myocardial infarct. The patient has been having chest pain for at least twelve hours, and if the CKMS is negative, he can send the patient home; however, if the test is positive, he must admit him to the coronary care unit. I tell him that we will first do a total CK, and, if elevated, a CKMB screen. The total time for both procedures should not exceed 90 minutes, and if either is negative, the patient may be safely sent home. If the screen is positive a confimatory CKMB test will be done later in the day. He is quite satisfied and tells the patient of the testing plan.

Creatine Kinase is an enzyme that has two separate forms: an M and a B monomer, which combine to form either MM, MB, or BB. When patients have high MB activity in their serum (defined as greater than 6% of the

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Notes From The Underground

continued

total CK activitiy and an absolute value of greater than 10 units for a female and 13 units for a male) the test is considered positive, and indicates myocardial damage. If the patient is in the right age range and has an abnormal electrocardiogram, the test becomes diagnostic of a myocardial infarct. As with all tests, positive results occur in other diseases; in the case of CKMB, polymyositis, muscular dystrophy, dermatomyositis, Reye's syndrome, and others must be excluded.

8:13 a.m. I check the pathology laboratory and find that today's work will consist of two hundred and fifty seven slides on ninety six patients. Our department of three pathologists will be called upon to diagnosis cases which may vary from one slide on a young girl's tonsils, to three slides on a diagnostic biopsy of a colonic polyp, to fourteen slides on a total hysterectomy specimen. Brain tumors, skin tumors, and lipoma follow in succession. We will have many difficult decisions to make in the next 8 hours.

9:02 a.m. We retreat for coffee. However, while in the doctors' lounge, Art Brightwell, a prominent internist, asks about a positive Clostridium difficile test. He has a fourteen year old girl who has been on large doses of antibiotics, including Ampicillin and tetracycline, and has developed profuse dark red diarrhea. He wonders if the test could be a false positive. Unfortunately I have forgotten the pertinent data and will have to look it up. After his description, the donut is not so appealing, and I return to the lab.

9:33 a.m. I call Dr. Brightwell back, indicating the test is not likely to be a false positive, given the clinical information, the test sensitivity of 88%, specificity of 98.2%, and predictive value (positive test) of 95.7%. He concurs.

Antibiotic associated pseudomembranous colitis is a complication of treatment with a wide variety of antibiotics, which may result in the inhibition of the normal bacterial flora of the intestine and the overgrowth of pathogens, such as Clostridium difficile. This organism produces toxins A and B which are excreted into the lumen of the intestinal tract. When the usual latex agglutination test is compared with the culture cytotoxicity "gold standard" test, it is found that the test has a specificity of 98.2%. This is the probability that a patient who has no disease will have a negative test. The sensitivity of the test is 88%. This is the probability that a patient who has disease will have a positive test, and is defined as the true positive times 100 divided by the true positives plus the false negatives. Thus, in combination with appropriate clinical data, the test may be considered confirmatory. Obviously, if a population of "normal" people are screened by this test, false positives will occur 4% of the time, and, conversely, approximately 5% of patients with the disease will have a false negative test.

The day is barely half over and I have miles to go before dinner. Today's mail brings a final summary of the CLIA 67 requirements, which stipulate new proficiency testing regulations for laboratories. These must be reviewed with the laboratory manager and departmental supervisors. A patient in the hospital will have a febrile transfusion reaction, and this will trigger a microbiologic and serologic evaluation in the laboratory which will be reviewed by a Pathologist. Almost 100 cytology specimens, most of which are pap smears, will be prepared and screened, and the positives read by the pathology staff. An unusual parasite may be identified in the stool of a patient. Another may have a blast in his peripheral blood, which will trigger a hematologic workup for leukemia. Quality control data will be reviewed. I will photograph a case for presentation at next month's Cancer Conference.

By **4:00 p.m.** the eyes have had it, and I head for home. I think a glass of Bordeaux is in order. ■

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Flow Cytometric Analysis Basic Information

Dr. Ralph Otto is a pathologist at Baystate Medical Center, and co-director of the flow cytometry laboratory. He is also Chief of Pathology at Ludlow Hospital.

For those not familiar with the flow cytometric instrumentation, the following is a brief description of that instrumentation and its clinical applications.

A flow cytometer is fundamentally a sophisticated fluorescence microscope with light detectors, photomultiplier tubes, and computer capability. It uses a pure light source, a laser, at a specific wavelength to interrogate cells that are arranged in single file through flow cell detector system by hydrodynamic focusing. The cells passing through this detector system on a one by one basis at about 10,000 cells per second have been tagged by a monoclonal antibody which has a fluorescent label on it. The laser beam passing onto these cells excites the fluorescent labels and their emitted light is picked up by photomultiplier tubes. Additionally, because of forward and lateral scatter of the light, various other physical properties of the cell can be evaluated, such as the cell cytoplasmic content and the cell size. The result of this multi-parameter analysis is displayed on a computer terminal in the form of a scatter gram of the individual cells. This scatter gram eventually builds up to a cell population pattern.

Because of the computer capability it is possible to actually gate on certain areas of the cellular populations that one wishes to specifically analyze. This analysis would be based on cell size, cytoplasmic content as well as the fluorescent monoclonal labelling. For example, if one analyzes peripheral blood in the flow cytometer, there would be a cell population distribution showing small, intermediate and large cells, or, as it turns out, lymphocytes, monocytes and granulocytes. If one wished to evaluate the lymphocytes (the smallest of the cells), one can electronically draw a fence or gate around this population and analyze it with multiple monoclonal antibodies to determine whether it is clonal, or, what type of cellular population it is. Finally, all this information is stored in the computer so it can be rerun and remodeled to help further define and evaluate these cell populations.

Utilization With The Advent Of Hybridoma Technology

Because of hybridoma techniques, the development of pure monoclonal antibodies to many different cellular membrane antigens (epitopes) is now possible. Since

continued

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Flow Cytometric Analysis

continued

flow cytometer laser technology looks primarily at labels on the cell surface, most of the monoclonal antibodies used in flow cytometry technology are those directed at cell surface antigen clusters. These are the so called cluster designation grouping or the CD groups. These techniques have allowed researchers to develop an immunological panel to surface membrane antigens that are related to cell differentiation. As a consequence of this it is now possible to identify lymphocytes in various phases of differentiation.

In neoplastic conditions ranging from acute leukemias through lymphomas to plasma cell tumors and well differentiated lymphomas and leukemias, this knowledge of membrane antigen association with differentiation is used to classify the neoplastic proliferation.

The flow cytometry instrumentation can in most instances with adequate samples of neoplastic lymphoid or hematopoietic tissue identify the type of lymphoma or leukemia present and subcategorize it immunologically. This has proven to be clinically beneficial particularly with the leukemias and lymphomas.

Since the flow cytometer can measure approximately 10,000 cells per second, and, can detect 200 antigen binding sites per cell, it is very sensitive. It can be used for peripheral blood studies to identify very small populations of cells and also to identify certain cell lineages. T4/T8 ratios of peripheral blood lymphocytes are also performed using the same hybridoma monoclonal antibodies and laser technology. CD4 (T4/helper cell) depletion in patients who have the human immunodeficiency virus or AIDS, can also be identified.

Monitoring of transplant patients is another area of flow cytometric technological utilization. This process is being evaluated in a number of large institutions and appears to have potential for future untilization. Recent articles have shown that dual color analysis of CD33/CD34 in peripheral blood to find primitive granulocytes is an excellent way to monitor bone marrow transplantation graft survival.

Fluid Analysis

Pleural fluids, bladder washings, broncholveolar lavage, etc. Can be analyzed by the flow cytometer providing similar information to that which can be generated from a solid neoplastic process.

Future Utilization

The future of this type of instrumentation is quite promising. Although at the present we use dual color analysis, there is already possible simultaneous five color analysis. In the future undoubted much more complicated multi-labelling of cells will be available. Such instruments will be capable of telling a pathologist whether the tumor is genetically normal, if there are oncogenes present, possible virions embedded in the DNA and the type of cell present in the neoplastic process. For example, the processing of a patient with a small non-cleaved malignant lymphoma would end up with the following information; cell size; moderate, CD markers, CD45; CD19; CD20 and CD10 positive, showing light chain restriction, C-MYC gene present, EBV virion present, cytogenetic translocation (8-14). This type of descriptive analysis would be consistent with Burkitt's lymphoma.

It should be emphasized that at the present time there is a tremendous need for morphologic coroboration with the present flow cytometric technology. It is anticipated that this type of marriage between the morphologic light microscope interpretation and the flow cytometric analysis of tissue will be intact for many years to come. The first decade of the 21st century, however, may tell an entirely different story. ■

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"Crisis In Practice Of Forensic Pathology In Massachusetts"

Dr. Loren Mednick is the remaining forensic pathologist in the Springfield office of the state medical examiner's office. A year ago, Springfield had three forensic pathologists and the state chief medical examiner's position was occupied by Dr. Brian Blackborne. Now Doctor Blackborne and Drs. Adams and Smith from Springfield have left for positions in other states. Since 1982, the budget of the chief medical examiner's office, a division of the Department of Public Safety, has been declining.

The duties of the Springfield medical examiner involve the certification of most cases of unattended deaths in a series of legally mandated instances. The criminal cases are those in which other physicians would rarely become involved unless a family member was a victim of a violent crime. The forensic autopsy, as explained by Dr. Mednick, is a different autopsy than the one that most physicians have seen in medical school. The gross examination is the most important aspect. In the examination the pathologist seeks to determine that the cause of death was other than natural by looking for evidence of trauma on the body itself and by making an analysis of the scene at which the body was found. The most important laboratory studies are those for toxicology and for studies of the brain.

Dr. Mednick has come before the Hampden District Executive Committee to request assistance of physicians at this time of crisis in forensic pathology. Besides homicide cases, the medical examiner's office is also expected to certify death in cases where the person died at home unless they have a regular attending physician. In Dr. Mednick's experience, covering physicians during weekends, have been sometimes reluctant to sign death certificates in these cases. They sometimes feel that the medical examiner should review the case and perhaps perform an autopsy. In some of these cases, the physicians involved believe that the medical examiner will perform an academic type autopsy to determine whether the patient died of underlying heart disease, or another unsuspected illness. In fact, the forensic autopsy has as its purpose the determination of whether the death was natural. In Dr. Mednick's view then, if a patient has been under a regular physician's care and is known to have chronic cardiopulmonary disease and if the police report (which the medical examiner's office can supply to the private physician) shows no reason to suspect foul play then a death can be certified by the private physician rather than the medical examiner. At this time, this assistance from private physicians will be very helpful to the medical examiner's office.

Among the current deficiencies in the budget of the medical examiner's office include the fact that the central computer bank at the chief medical examiner's office in Boston has a filled data base as of last year and that there are no funds available at present to expand the system. In addition, the toxicology specimens and brain samples which are taken are forwarded to the state lab where turn around time of the specimens has now been expanded from three to six months. Only very limited funds are available to x-ray bodies that are found and it has even been suggested that the x-ray facilities available in Worcester be used, which would require transport of bodies from Springfield to Worcester as an "economy" measure.

Judy Zeprun, the new first district attorney, has commented as has Bill Bennett, that the current facilities of the medical examiner's office are not sufficient to meet the needs of the District Attorney's offices in Western Massachusetts in prosecuting homicide cases. The court, partly in an effort to relieve over crowding in the Hampden House of Corrections, has required the District Attorney's office to bring criminal cases to prosecution within six weeks of arrest. Delays in the processing of specimens and the shortage of staff to perform autopsies are creating unacceptable delays in their proceeding to trial in criminal cases. District Attorney Bennet is also very concerned that with the current level of capability. Instances of occult homicide for example, from suspected child abuse) may not be elicited.

District Attorney Bennett has written to the President of Mass Trial Lawyers Association to ask their help in addressing this problem, and preventing the closure of the Springfield Office.

Dr. Mednick feels that his department performs a service in counseling family members when a person dies who is not being attended by a medical doctor. It is his impression that there are many such elderly patients who for economic reasons are not seeking the regular attention of medical doctors and at the time of death become medical examiner's cases. In these cases, the medical examiner fulfills the role of an advisor to the family that is ordinarily taken by the private physician.

While Dr. Mednick is confident that the Springfield Medical Examiner's Office can continue, he is very concerned that any further budget cuts will severly compromise the service that can be offered. He is seeking the support of physicians in his efforts to point out the crisis that exists and obtain relief from the current crisis within the system. ■

Brigid Glackin, M.D.

Molecular Genetics And Clinical Laboratory Medicine Today

Dr. Pfluger is Chief of Cytogenetics at Baystate Medical Center.

The Human Genome Project is a massive endeavor which has been described in the popular press as biology's equivalent of the effort to land a man on the moon. The project, which will take an estimated 15 years at a cost of $3 billion to complete, has as its goal the recognition and mapping of all the genes in the human genome. The DNA of a single cell is composed of a three foot long coil of 5x10 9 base pairs of the nucleic acids adenine (A), cytosine (C), guanine (G), and thymine (T), which form codon triplets for specific amino acids. The double helix of DNA forms the 23 pairs of human chromosomes including the 50,000-100,000 active genes which serve as the blueprint for the developing embryo and predict susceptibility to a wide range of diseases.

The connection between single genes and inherited conditions is well established and for some traits easily understood. For example, a single base pair substitution of thymine for adenine leads to an amino acid substitution of valine for glutamic acid in the betaglobin molecule, which in turn results in an alteration in the red blood cell known as sickle-cell anemia. The disorder can be diagnosed by evaluating the sickling properties of the defective cells in response to hypoxia or by hemoglobin electrophoresis. Now sickle-cell trait or disease can also be diagnosed by direct identification of the abnormal gene sequence, a technique allowing for rapid prenatal diagnosis in at risk gestations. In this technique restriction endonucleases, scissors-like enzymes, are used to slice the DNA molecule into smaller pieces. These cuts occur wherever specific sequences of DNA recognized by the particular endonuclease are found. The normal hemoglobin A molecule has the sequence CCT-GAG-GAG as the fifth, sixth, and seventh codons, whereas hemoglobin S has the sequence CCT-GTG-GAG. Restriction endonucleases have been identified which recognize the normal gene sequence, cleaving the normal molecule into two fragments but leaving the abnormal gene intact. Electrophoresis is used to sort the restriction fragments by size. A process called Southern hybridization is then used to identify the sequences of interest from the many fragments of DNA present. In this technique, the size-sorted DNA is first blotted onto nitrocellulose paper and then reacted with a gene probe hybridizing to the sequences found in the betaglobin gene. Autoradiographic identification of the labeled probes enables one to determine whether the betaglobin gene is found in the longer unbroken sequence (indicating the sickle cell gene) or the shorter fragment (the normal gene), thus permitting diagnosis from a small sample of DNA. Since DNA can be found in virtually any tissue, this test can be used for prenatal diagnosis using uncultured amniotic fluid cells or chorionic villi.

This same technology can be applied to rapid diagnosis of virtually any genetic disease once the normal and abnormal DNA sequences have been identified. Cystic fibrosis is a debilitating condition affecting as many as 1/1600 children of northern European heritage. Until recently there was no way to identify at risk couples until the birth of an affected infant indicated that both parents were carriers and would have a ¼ chance for recurrence in any subsequent gestations. Use of restriction enzymes to recognize variable sequences in close proximity to the CF gene (restriction fragment length polymorphisms or RFLP's) offered the first breakthrough in prenatal diagnosis. However this required comparison with the DNA pattern from an affected individual within the same family. If DNA from a known affected were unavailable because of death or unwillingness of the affected individual to contribute a blood sample, the testing could not be performed.

The identification of a major mutation for cystic fibrosis in 1989 led to new hope of carrier screening for individuals for whom a family comparison study could not be performed. This mutation, a loss of three base pairs coding for phenylalanine in position 508 of a chloride transport regulator gene, is referred to as the delta F 508 deletion. The abnormal gene accounts for approximately ⅔ of all CF carriers. Although the test is not ideal (it misses approximately ⅓ of carriers who are at risk because of other less common mutations in the gene), identification of the CF gene is the first step in providing effective carrier screening and ultimately a cure for this devastating disease. The faulty gene interferes with chloride transport in the secretory epithelial cells lining the airways, which in turn causes water to be removed from the respiratory mucus. This leads to thick, viscous secretions which increase susceptibility to chronic infections and ultimately lead to untimely death of affected individuals. Recently scientists have found a way of introducing new genes which open the chloride channels in cells affected by CF. It is anticipated that this will lead to effective gene therapy, possibly within the next five years. Similar advances are occuring in other single gene disorders such as Duchenne muscular dystrophy and neurofibromatosis.

Single gene disorders represent only a small part of human morbidity and mortality from inherited disease. The most common disorders appear to result from complex interactions among multiple genetic and environmental factors. Coronary artery disease, cancer, hypertension, obesity, and diabetes are examples of polygenic/multifactorial disorders not only with a significant hereditary component but also environmental risk factors. Cancer affects over 6 million Americans with new cases occurring at a rate of approximately 1 million each year. Genes which can lead to cancerous growth (proto-oncogenes) are normally supressed, but mutations

in these supressor genes can lead to malignancy. Identification of faulty genes early in life can potentially enable one to make life style changes that will decrease environmental carcinogen exposures and can also lead to earlier detection through more aggressive follow-up in the high risk individual. Eventually, it may be possible to manipulate the genetic factors predisposing to cancer, leading to cure even before onset of clinical disease.

Heart disease affects approximately 5 million people in the U.S. with about 1.5 million heart attacks annually in this country.

There now appear to be well over twenty genes that affect cholesterol metabolism. The genes governing circulation lipoproteins are a target in present research on heart disease, lipoproteins are complex molecules composed of cholesterol, triglyceride, phospholipid, and protein moieties. Today, screening for heart disease includes evaluation of lipoprotein levels with risk assignment based upon the results. For example, the levels of low density lipoprotein (LDL) are a major independent risk factor predisposing to coronary artery disease. An autosomal dominant defect in the LDL receptor gene leads to familial hypercholesterolemia and individuals with two copies of this gene often suffer fatal myocardial infarctions in young adulthood or even childhood, whereas the progression is slower in individuals with only a single copy. Researchers have found evidence of a gene which supresses LDL and thus could decrease risk for infarction in individuals who are genetically susceptible. This offers potential for actual cure, more effective then present cholesterol management protocols using diet, bile acid sequestering agents, exercise, and stress reduction.

There is little doubt that the impact of present efforts in molecular genetics will have profound effects which will forever change the way in which we practice medicine. Gene mapping techniques including in situ hybridization and somatic cell genetics are being used to assign particular genes of interest to a specific chromosome region. This will permit identification of carriers within the family, but can also complement the efforts in DNA sequencing in identification of abnormal genes. This in turn may aid in identification of the specific gene product, a major step towards understanding the pathophysiology of the disease and to eventually a more effective therapy.

The ability to screen the population to identify at-risk individuals and then to offer specific gene therapy will lead to much greater emphasis on prevention of those conditions which are the main consumers of health care dollars today. One would anticipate increasing demands for genetic testing as screening methodolgies move from the research arena to the clinical laboratory. Already today, couples contemplating pregnancy are asking about screening for genetic risk factors such as CF. Newly available products of genetic research such as the delta F 508 deletion are being publicized in newspapers and popular magazines, increasing requests for testing by sophisticated consumers. Commercial laboratories have been only too happy to move rapidly in order to meet this demand. As the human gene mapping initiative leads to the ability to detect the 7-10 deleterious genes each of us carries, the demand for this type of service can only increase, with potential liability exposure if a test is available but not offered.

New methodologies such as the polymerase chain reaction (PCR) will allow tests to be done using a minute sample of DNA, even from a single sperm. This DNA can then be rapidly amplified to provide sufficient material for analysis, a method which has shown considerable promise in forensic DNA fingerprinting. Such analytic techniques could potentially allow for testing of preimplantation embryos for potentially lethal diesease. More invasive prenatal diagnostic techniques such as chorionic villus sampling (CVS) and amniocentesis with their association risks might be replaced by a simple sample of maternal blood for isolation of circulating trophoblastic cells as a source for fetal DNA. DNA sequence amplification through automated PCR methodology is now being used as a powerful tool for research in gene mapping but will undoubtedly find a place in the clinical diagnostic laboratory as new technologies decrease the costs associated with these presently labor intensive test procedures. There will be a critical need for laboratories with trained personnel as DNA analysis becomes established as standard practice. This human resource shortage, already being felt acutely within the genetics community, will affect the clinical laboratory as well.

As exciting as the present advances in screening and diagnosis may be, the future lies in the understanding of underlying disease processes. The ultimate goal will be safe and effective treatments for genetic diseases, rather than simply identifying carriers at risk for genetic disease. Whereas the initial impact will be in laboratory medicine, profound changes are already beginning to occur in traditional clinical specialties such as obstetrics, pediatrics, and medicine. This can only continue as increasing numbers of genes are mapped and identified. ■

Environmental Hazards and Risk Management: *What Every Physician Needs To Know*

A risk management program for physicians on environmental hazards and risk management will be held at the Holyoke Holiday Inn, on Friday, March 1, 1991, from 8:00 a.m.—10:00 a.m. The conference will address the issue of lead and the environment as well as risk management and environmental exposures. The conference is sponsored by the Postgraduate Medical Institute in cooperation with the Massachusetts Medical Society, the Hampden District Medical Society, and the Massachusetts Department of Public Health's Environmental Health Education Project for Physician and Health Professionals. Two credit hours in Category One (one credit hour risk management) will be awarded. ■

Preserving Professionalism:
The Fight We Must Win

Address to Hampden District Medical Society on Tuesday, January 22, 1991 at the Ramada Hotel in West Springfield, Massachusetts.

Good evening. I am really honored to be here with you. Since I represent the American Medical Association, I'm sure you will have some questions you'd like me to answer—and I'll be glad to do that in the Question and Answer period.

But first, I'd like to ask you to take this opportunity to think about the heart and soul of why we are all gathered here. I ask you to think about the one thing all physicians have in common—our commitment to medicine. This professional commitment to our art, our science, our profession is the central force that binds us together.

But I regret I must warn you that today as never before, our professionalism is being threatened. Many articles are appearing in the literature on the deprofessionalism of medicine—including articles in the Journal of the American Medical Association and other prestigious journals.

Now threats are nothing new to us. We're used to them—threats like government regulation, professional liability suits, and hassles by third party concurrent reviews. But this one is different. It is more subtle because it is gradual, and more dangerous, because it strikes at the very heart of who we are and what we are. And it is driven by people who for one reason or another—but principally economic—want to see medicine reduced to the status of a mere trade, a business venture, a public utility.

To do this, they must somehow DEPROFESSIONALIZE medicine. Or at least, they must REDUCE the PROFESSION of medicine to a level where much—or all—of the RESPECT we now enjoy is GONE. How many times can we hear ourselves called VENDORS before we start acting like vendors? How many times can we hear ourselves called PROVIDERS before we start thinking that's all we are? How many times can we hear ourselves encouraged to become competing ENTREPRENEURS before we regard ourselves as only that?

What is at stake here is the issue of FREEDOM: our PROFESSIONAL freedom and our very PROFESSIONALISM itself. I want to tell you why professionalism is so important, what the American Medical Association is doing to preserve it, and what YOU can do to preserve it.

Professionalism has three principal elements. First, a profession has a BODY of knowledge which each professional must master and which the profession as a whole must update. Second, a profession sets a STANDARD of behavior greater than that of a trade—ethics, if you will. And it develops a mechanism for self-regulation and policing to see that those standards are met.

Third, professionalism is based on a special—and in medicine's case an almost sacred—relationship between the professional and each person that professional serves, a relationship which puts the interest of the patient above all other considerations. And it's even more than that. It is no accident that two of the most important words in medicine—the word 'patient' and the word 'compassion' come from the same Latin root—the verb "patior" that means "to BEAR a BURDEN," so that the patient is one who bears a burden, and the truly compassionate physician is one who shares that burden—lifting it when possible and making it lighter when that is all that can be done. But always CARING.

This burden-sharing has always been the hallmark of the medical profession. To put this unique quality of our profession into simple terms, I think of the little girl whose father sent her to pick up some bread at the grocery store. The little girl was gone much too long, and just when her dad was getting worried, she came into the house—bread in hand. Her father asked her where she'd been for so long. She told him one of the neighbor kids had broken his tricycle and the reason she was late was that she had stopped to help him. Her dad looked at her in amazement, and he commented, "I didn't know you knew anything about fixing tricycles. "Oh, I don't," she said. "I just sat down and helped him cry!"

Now that ability to help our patients cry—to help patients bear their burdens by sharing those burdens with them—is an important and unique part of the doctor-patient relationship. Because though curing patients brings a joy and satisfaction like no other, it is the burden-sharing—the compassionate human connection—that has ALWAYS made medicine such a wonderful, FULFILLING PROFESSION!

And that is why our professionalism is to us doctors our very identity as doctors. So when our professionalism is threatened, we must DEFEND it! And, let me tell you—this is one fight we're not going to lose!! It's not going to be easy, because there are potent economic and political forces in play here. But from doctors in Western Massachusetts and all around America to the President of the American Medical Association, we must and will pull together to preserve all that is good about this great and noble PROFESSION of ours!!

Let me tell you what the American Medical Association is doing to lead American doctors to this fight. First, to preserve and build that body of medical knowledge, AMA is the world's largest publisher of scientific and medical information, and it will remain so. Since its founding in 1847, the American Medical Association has been instrumental in setting standards for medical education. And the Association continues its role in upgrading public health and fostering high standards of medical care.

continued

Second, the American Medical Association leads in activities to encourage and enhance ethical behavior in our profession. We write the ethics for the medical profession in the United States. From its beginnings, AMA has been active in developing and refining statutes to make examinations and licensure mandatory for those who would practice our profession. AMA is a leader in professional self-regulation. And on another ethical front, you can always count on AMA's Council on Ethical and Judicial Affairs—thoughtfully and thoroughly—to update ethical standards for areas of professional conduct—such as confidentiality, patient referrals and withholding or withdrawing of life-prolonging medical treatment.

And though representatives of the Federal Trade Commission have said on numerous occasions that physicians are entrepreneurs and that medical practice is a mere business, AMA has always insisted that our responsibility—our ethical responsibility—is to our patients, not to ourselves, not to our government, and not the bottom line—ours or anybody else's. It is to our patients.

This brings me to what AMA is doing to protect the vital, unique, sacrosanct DOCTOR-PATIENT relationship. Nothing is more important to AMA than this. We foster it every chance we get. In fact, whenever I'm asked to tell the purpose of the American Medical Association, I always say that our mission is to help doctors be better doctors, and to help people be healthier people. The two jobs are entwined. And everything we do to help doctors be better professionals has a direct, positive benefit for patients as well.

Now, what can YOU do to preserve professionalism? The most important thing is to do what you've always done: put your patients first. Second, I urge you to stay active in ORGANIZED MEDICINE. Give of your time. Give of your talent. Pay your dues—and not just in money! Because the District Society needs you to carry on its fine work, such as caring for the homeless. The Massachusetts Medical Society needs you, too. And so does the American Medical Association—so we can represent you well in the all-important national arena.

One physician alone can do very little about the legislative, regulatory and judicial decisions that impact us—and our patients. But if you join with other individual physicians in organized medicine, then your voice can—and will—be heard.

Finally, to preserve professionalism, be aware that there are folks out there who'd love to see professionalism disappear from the medical scene. And that there are competitive pressures on us that could tend to diminish our professionalism.

Let's not LET it happen! We're going to fight to maintain it. And we're going to win this one. You know why? Because of organizations like the Hampden District Medical Society, and because of people like YOU! Thank you. ■

John J. Ring, M.D. President-Elect
American Medical Association

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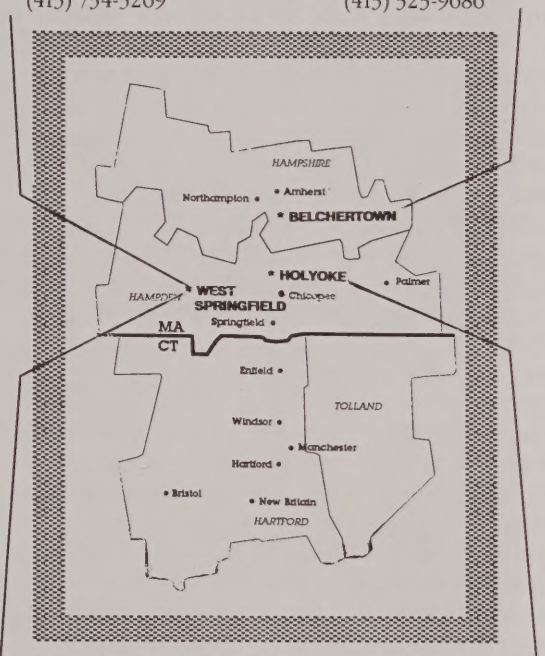

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Doctor William F. Bria II is a pulmonologist at Baystate Medical Center, and is the Physician Director of the Patient Care Information System.

For the past 3 years, Baystate Medical Center has been engaged in the design and implementation of a state of the art Patient Care Information System (PCIS) designed to improve the quality and effectiveness of healthcare delivery. This system will perform all functions relating to patient order entry, results reporting, patient care scheduling and billing and retain the information in an innovative permanent electronic patient record.

The PCIS acts as an integrated communications system interlinking patient care areas with all services at BMC for in and out patients. Terminals work by pointing at on-screen selections using a lightpen and typing is usually unnecessary. A *network* of over 400 terminals thoughout BMC will connect to a large main computer and will transmit orders and return results from all hospital departments to wherever clinicians need these data. Once a physician enters a patient's orders through the system, that information is instantly transmitted throughout the hospital to exactly where it needs to go: drug orders to the pharmacy, x-ray requests to radiology etc. Delays in order interpretation, transcription and transmission are effectively eliminated. For inpatients, a copy of all orders is also automatically received so nursing can anticipate patients receiving new tests and medications automatically. Stat orders actually set off a brief alarm ring on the nursing station printer alerting staff to the priority of an incoming order!

Baystate Medical Center is the first hospital to have this new generation patient care system (commercial name TDS 7000). An older version of this system is currently in use in over 150 different hospitals in the U.S. and Europe. BMC's new system has several clinically significant features: 1. permanent patient record. 2. personal physician order sets, and 3. patient appointment scheduling.

The installation of the system is divided into 3 phases. Phase 1 consists of patient registration, patient appointment scheduling and radiology information. This phase was installed in August of 1990. Phase 2 consists of order entry and results reporting from all major clinical departments (laboratory, pharmacy, respiratory care, dietary etc.) and is scheduled for installation in the spring of 1991. Phase 3 will include advanced charting functions (nursing care plans, ancillary department charting etc.) and other system enhancements are scheduled for the fall of 1991.

The permanent patient record (PPR) feature of this new system provides the capability of storing a patients complete medical record for a lifetime. This "Holy Grail" of medical computing is now possible with this systems capacity of storing over 16.4 million patients with several thousand pages of clinical data EACH. This capability means clinicians will have rapid access to inpatient *and* outpatient information. Labs, X-rays, allergy information, diagnoses, billing information and other elements of the patients record can easily be retrieved, reviewed and even printed out by the physician. Although this capability can be accessed by any physician anywhere throughout the hospital, it will be particularly desirable for physicians to have this resource available right in their offices. Three pilot physicians offices have been selected in the Springfield area to test this remote link feature of the PCIS program. The fact that PCIS delivers both order entry *and* results reporting directly into the office should provide significant benefits in clinical practice effectiveness and efficiency for physicians.

The benefit of remote access would not be as great if all transmitted orders had to be consigned on the nursing units or medical records. Fortunately BMC is the first hospital in the state to have state medical board approval of the electronic signature. What this capability essentially means is that orders written online by a physician using his/her personal secret sign on code stands as the legal signature for that order, no further cosignature is necessary. The implications for busy clinicians is obvious and clearly positive.

Physicians personal order sets are online customized lists of orders that may be used in a great variety of ways. Protocol orders, pre/postop care, standard pain control protocols, pre procedure medications and testing

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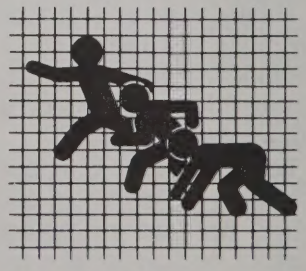

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are all amenable and individually selectable in physician-specified sets. These sets can be named according to diagnosis, procedure, patient or any manner useful for the individual physician. Some physicians have used this capability to include online *reminders* of differential diagnoses, tests etc. Since the user has total control of this scratch pad area of the system, the possibilities are endless including creating your own electronic *peripheral brain.*

Patient appointment scheduling was developed as a centralized booking system linked to the permanent patient record. Equipment, personnel and rooms within BMC can be assigned as *resources,* each with a special schedule template against which any patient appointment can be made. This centralized system will ease access to hospital services for physicians and their patients.

Physician involvement in the PCIS began prior to system selection with direct site visits to hospitals that had installed information systems and had achieved direct physician use. Following system selection, a 30 person physicians task force was created with representation from all disciplines in the BMC medical staff. Physicians on this committee were involved with initial system design and now with testing and debugging. A residents task force was also created, representing the viewpoint of all of the physician training programs at BMC. The input from all of these individuals continues today, reviewing PCIS pathways and testing the effectiveness of the physician training program.

Physician training will consist of a combination of personally supervised instruction, independent self-paced computer based training and practical hands-on use of the system. A primary goal of the physician training effort will be to customize the information given to the system to meet his/her own practice and system use needs. With a resolution from the Medical Staff to fully support direct physician use of the system, maximum effort will be made to make training time fit around physicians' busy schedules including 1 on 1 sessions when necessary. The PCIS physician trainers are dedicated to demystifying the system for physicians, and making it understandable as a tool for daily practice.

The primary goal of PCIS is to improve the quality of patient care. By putting this new and powerful information tool directly in the hands of those individuals responsible for directing that care, the physicians, it is anticipated this goal *will* be achieved, to the benefit of physicians and their patients.

The PCIS system went on-line February 14th, 1991. Over the next 40 weeks, it will be fully implemented. ■

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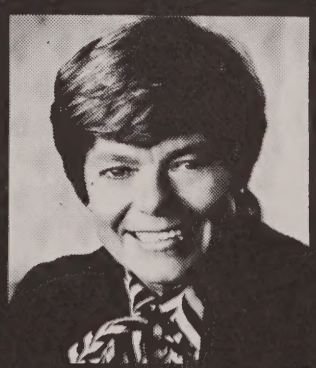

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Bridges For Peace

Anthony Sobey, M.D. practices Internal Medicine in Springfield, and is working to organize a purely medical exchange for health care professionals.

In November 1989, Tony Sobey, a Springfield internist, took an uncharacteristic coffee break in the Mercy Hospital cafeteria that led him thousands of miles from home. The conversation was desultory and he began reading a discarded issue of MMS NEWS. That's where he learned that Bridges for Peace, a group that had been sponsoring exchanges with the Soviet Union since pre-glasnost 1985, was looking for physician volunteers to join a trip to Moscow and the Ukraine in September, 1990.

Dr. Tony Sobey (second from right) with his host (in the white hat) and the staff of the regional medical center in Poltava, Ukraine.

Tony joined a group of 22 fellow Massachusetts citizens from various professions on a two week trip that began with several days of touring a gray, chilly Moscow that was expecting snow in a few weeks. One member of his group, a contractor from Pittsfield, noted the poor quality construction of the crumbling post World War II apartment blocks in the capitol. He felt that helped explain the devastation caused by the earthquakes in the southern USSR. The Kremlin was packed with tourists from Europe and Japan moving about in an atmosphere similar to a day at Sturbridge village.

The group then flew by Aeroflot to Odessa to begin the exchange part of the trip which was coordinated by the Soviet Peace Committee for the Ukraine. A gynecologist member of the group from Boston who wished to photograph the flight crew was invited to sit in the cockpit for the entire flight. Tony visited his own children's elementary school classes prior to the trip to collect questions to ask Ukrainian children when he visited Soviet schools as part of the exchange. He found the questions on both sides, regarding teachers and homework and sports, to be remarkably similar. Russian eleven year olds who were relatively fluent in English inquired about when American children study Russian.

A doctor in the group who was 65, said that the Ukrainian hospitals resembled those he worked in here in the early 1960s. a 1500 bed hospital in Poltava that served a population of 2.5 million people had no CT scanner and no facilities for cardiac catheterization. Besides the limitations on diagnositics, there were also problems in getting drugs like H-2 blockers for the treatment of peptic ulcer disease. Because the beds and the personnel were available, such patients were hospitalized and treated with antacids.

Tony stayed with the regional medical director for Poltava. The local medical students were on furlough harvesting the crops as were people from many different jobs. While some specialists within the system were relatively well paid, most physicians were paid less than speech pathologists or bus drivers.

The group traveled to Kiev which is 80 miles from Chernobyl. The effects of the nuclear accident there are seen in patients that have been relocated throughout the Ukraine. Among children, there are many new cases of aplastic anemia and leukemia. There are also patients that are suffering a generalized malaise that is believed to be related to radiation exposure.

Now Tony is working with Bridges for Peace to help organize a purely medical exchange for 15 health care professionals from Massachusetts during the first two weeks of July, 1991. The emphasis will be on understanding the major medical issues in the Ukraine. Then in January, 1992, a delegation of Ukrainian health care officials will visit Massachusetts to conclude the exchange. The cost, $2700, is similar to a two week tour of the USSR. Transportation will be via FINN AIR from New York to Helsinki direct and then on to Moscow. For further information contact Tony or Project Director Corlette Moore McCoy, US-USSR Bridges for Peace, 535 W. Chestnut St., Brockton, MA 02401, tele 508-588-7989. ■

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MEDICAL:	University of Vermont 1981-1985
INTERNSHIP:	St. Francis Hospital, CT 1985-1986
RESIDENCY:	St. Francis Hospital, CT 1986-1988
SPECIALTY:	Internal Medicine

Andrew B. Szumowski, M.D.
444 Montgomery Street
Chicopee, MA 01020

BORN:	April 16, 1946
PREMED:	College of St. Thomas, Minnesota 1964-1967
MEDICAL:	University of Wisconsin 1968-1971
INTERNSHIP:	Boston City Hospital 1971-1972
RESIDENCY:	Farmingham Union, Massachusetts 1972-1973
	University of Wisconsin 1975-1976
FELLOWSHIP:	University of Wisconsin 1976-1977
SPECIALTY:	Internal Medicine

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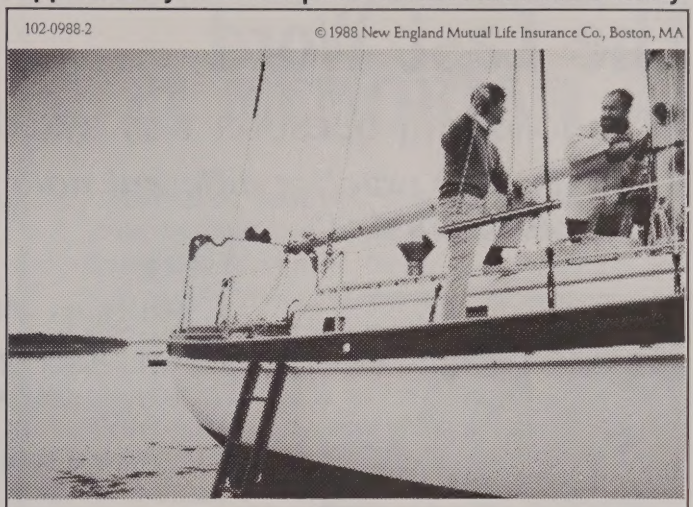

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The Last Word

■ The following question was asked of some area pathologists:

"How is your practice different now from ten years ago? Would you go into pathology again?"

Dr. Ben Parks, *Providence Hospital*

A: The major difference is the rapid progress of the technology, particularly immunohistochemistry, and this has been incorporated into our practice.

I think I was born as a pathologist. I like this field. If I had to choose again, I would most likely choose pathology.

Dr. John Blanchette, *Holyoke Hospital*

A: One big difference is in blood banking and red cell serology. We don't look for antigens and antibodies any more. Crossmatching is so much simpler. All of that science was insignificant... With the AIDS epidemic and the identification of hepatitis C, I probably spend 50% of my time preventing disease in the blood bank, as opposed to 5% 10 years ago.

I would absolutely go into pathology again... Because this is the best. The individual surgeon sees one case he's really excited about, but I see all the cases of all the surgeons. That's the real draw of the specialty.

Dr. Tom Gould, *Chief Holyoke Hospital*

A: In this geographic area when I came in 1979, almost all the pathologists were salaried employees of the hospitals. Now most of them have contracts with the hosptals the way radiologists or anesthesiologists do... with the Clinical Laboratory Improvement Act of 1988, the federal government established very rigid requirements for proficiency testing for example, limitations on the number of slides a cytotechnologist can screen over a period of time...

Fine needle aspiration cytology has replaced tissue biopsies in many cases. AIDS has revolutionized the way we handle specimens in general and given us a whole new cohort of related diseases to look for...

Computerization has greatly improved record keeping. Finally the introduction of non-physician pathology assistants (a master's degree curriculum) to handle the preparation of speciments is new.

For sure I'd go into pathology again. I'm happy with what I'm doing. ■

John J. Ring, M.D.

The new President-elect of the American Medical Association is a family physician from Mundelein, Illinois. Dr. Ring has been active in AMA functions, serving as Chairman of Standards/Survey Procedures, Chairman of the Council on Medical Service, Chairman of the Work Group of the Health Policy Agenda for the American People, and AMA delegate to the World Medical Association, where he served as the Chairman of the WMA committee on Medical Ethics.

He graduated from Georgetown University, and received his M.D. there as well. He served in the Naval Medical Corps for four years. He is a Diplomate of the American Board of Family Practice.

As reflected in his remarks (printed elsewhere) he is extremely concerned with the loss of a sense of professionalism by physicians. Physicians, he feels, have a serious morale problem. During his term in office, he intends to champion the American Medical Association's universal care plan (Health Access America) which he feels is the least expensive approach to the problem of access, and has the advantage of retaining the pluralism which exists now. He estimates that "Canadianization" of the Health care system would eventually cost society 330 billion dollars in new taxes.

He feels that we are losing sight of the grandeur of our profession, and that a symptom of this is the tendency of physicians to discourage their children from entering medicine. We need to remind ourselves that we are members of the best profession in the world, and that it is worth fighting for. ■

IN MEMORIAM

WAYNE C. BARNES, M.D. A graduate of Tufts, he practiced as an internist and cardiologist in Springfield. He served on the staff of Baystate Medical Center as chief of medicine, president of the medical staff, and as a member of the Board of Trustees. Contributions may be made in his memory to the American Heart Association, 33 Fourth Ave., Needham, 02194.

BERNARD N. GILCHRIEST, M.D. A graduate of Tufts Medical School, he practiced as a surgeon in Springfield. He was past president of the Mercy medical staff and was chief of surgery there; and also, on the Board of Trustees of Springfield Municipal Hospital. Contributions may be made in his memory to the Mercy Hospital and the Sisters of St. Joseph. ■

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The "Doctor's Letter"—What Is Our Obligation?

To the Editor: Patients seem to be continually trying to stretch the bounds of what they preceive as their phsysician's obligation. At least two calls to my office per week are requests for a "doctor's letter" for use in attaining some nonmedical goal. Not only is the volume of such requests increasing, but it seems to me that the overall level of patients' chutzpah in this regard is also getting out of control.

For years I have endured without comment the commonplace requests that I consider part of my broader obligation. These include requests for support in seeking excuses from jury duty, handicapped-parking permits, and changes in otherwise nonrefundable airline tickets. (These requests come from patients, from their relatives, from my relatives, and so forth. I have also had two patients change their minds about prepaid cruises and ask for notes to use in gaining refunds after cancellations.) Recently I have also fielded other calls. For example, a graduating high-school senior with systemic lupus erythematosus asked me to write to the housing-assignment officer at her Ivy League school requesting that she be given a single room. (Her rationale: "Lupus affects my concentration, and prednisone decreases my resistance to infection.") A wealthy woman with a 44-foot boat had failed to file income-tax returns for 1986 and 1987 and claimed to be facing $100,000 in penalties; she wanted a note for the Internal Revenue Service saying that she had been too sick from her arthritis to file returns. A similar request came from a woman who had failed to file state sales-tax forms for her business.

There are two aspects to the problem. First, we are already buried in paperwork. I now have patients who want duplicate copies of every prescription—one for a 10-day supply from the local pharmacy and another to mail away for a 3-month supply from a discount pharmacy service. I also have patients asking for insurance forms in triplicate—for the primary carrier, the secondary carrier, and "one for my file." But more important, doctors are being used as pawns in societal games, and we are forced to make a trade-off between alienating a regular patient and restricting the doctor-patient relationship to diagnosis and treatment. When I said no to the two patients with tax problems, they seemed rather surprised that I would not put my credentials on the line to help them get off the hook; they seemed to feel entitled to such notes. Perhaps organized medicine should issue some guidelines that we could quote, clearly delimiting our responsibility to patients. Alternatively, what are the Current Procedural Terminology codes for providing airline cancellation excuses (brief, intermediate, and extended)? ■

Robert A. Greenwald, M.D., F.A.C.R.
New Hyde Park, NY 11042
Long Island Jewish Medical Center

Reprinted from THE NEW ENGLAND JOURNAL OF MEDICINE, January 3, 1991.

Editors Note: Dr. Greenwald is continuing to collect examples of requests for non-medical letters from physicians. Readers who have had similar experiences are asked to send him a note about the requests made.

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